Szertics Gergely
AI4Science program

29 November 2024
Budapest

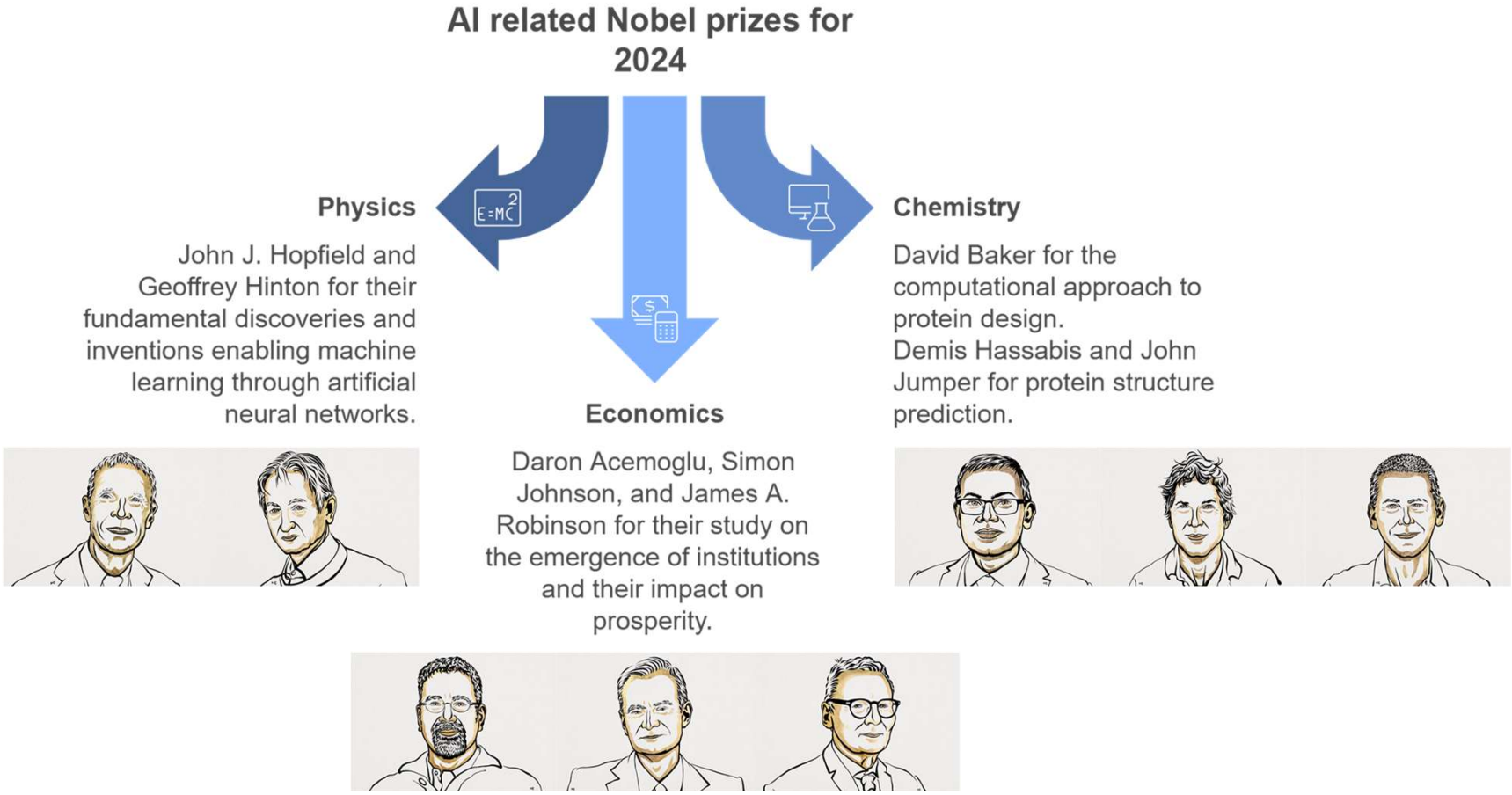
HUN REN

Gen AI 4 Science

Tools that can be helpful

https://hun-ren.hu/ai-4-science

There are exceptionally many Nobel prizes that went to AI related research



News is all around about AI enabling research

Introducing Aurora: The first large-scale foundation model of the atmosphere

Published June 3, 2024

By Wessel Bruinsma, Senior Researcher; Megan Stanley, Senior Researcher; Ana Lucic, Researcher; Richard Turner, Visiting Researcher; Paris Perdikaris, Principal Research Manager

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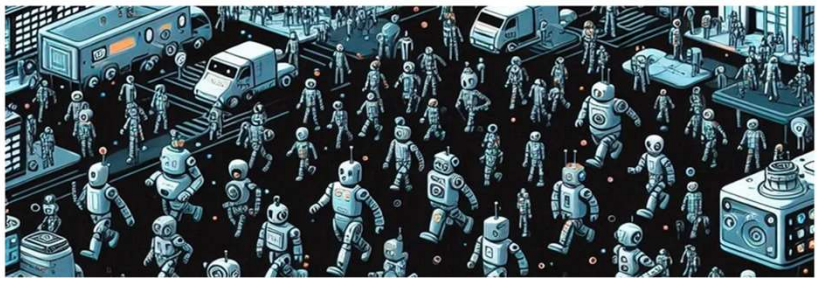
Simulating millions of LLM agents with AgentTorch

By **Ben Dickson** - October 2, 2024

Facebook | Twitter | Reddit | Linkedin



sakana.ai

The AI Scientist: Towards Fully Automated Open-Ended Scientific Discovery

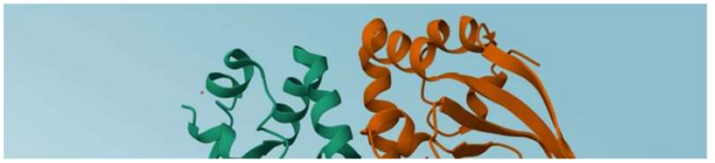
August 13, 2024

NEWS | 11 November 2024 | Correction 14 November 2024

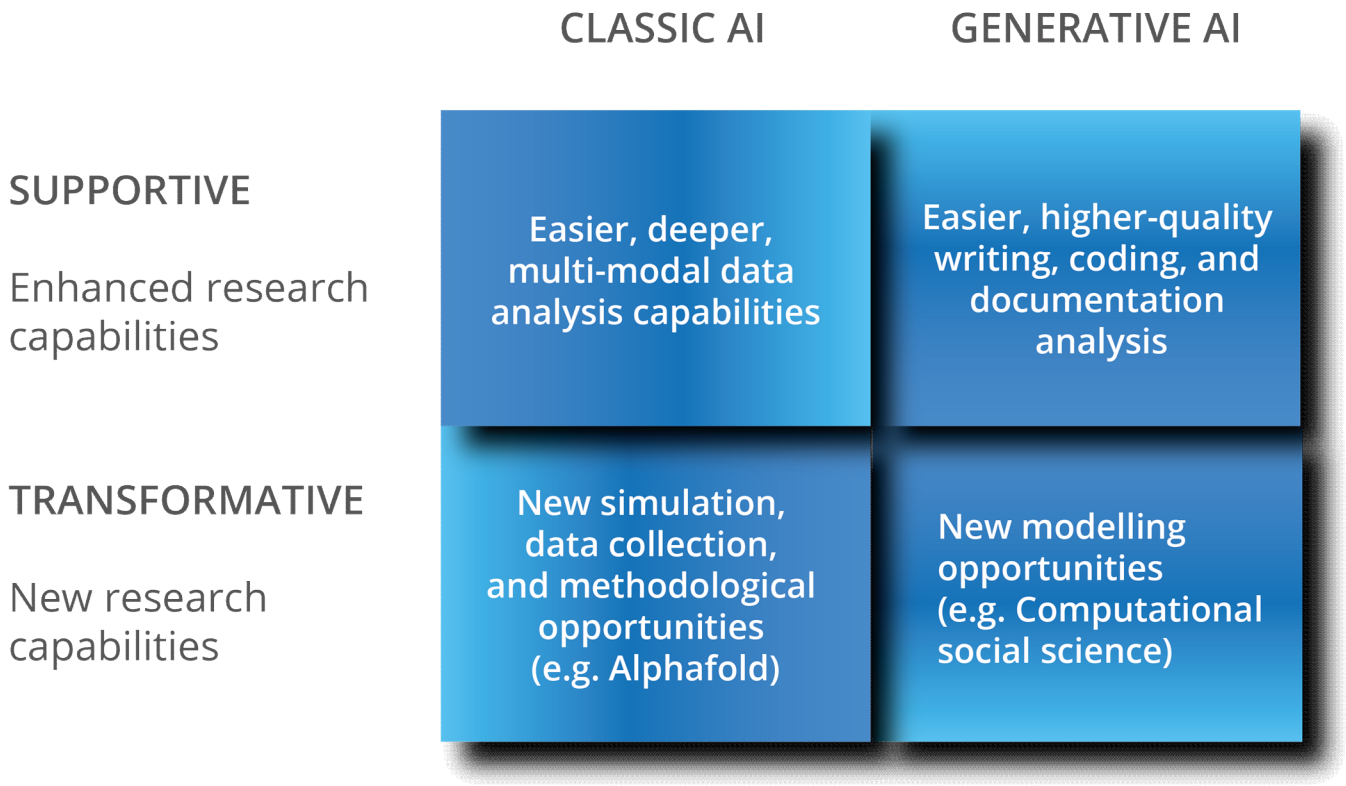
AI protein-prediction tool AlphaFold3 is now more open

The code underlying the Nobel-prize-winning tool for modelling protein structures can now be downloaded by academics.

By Ewen Callaway



AI can help researchers in all kinds of tasks

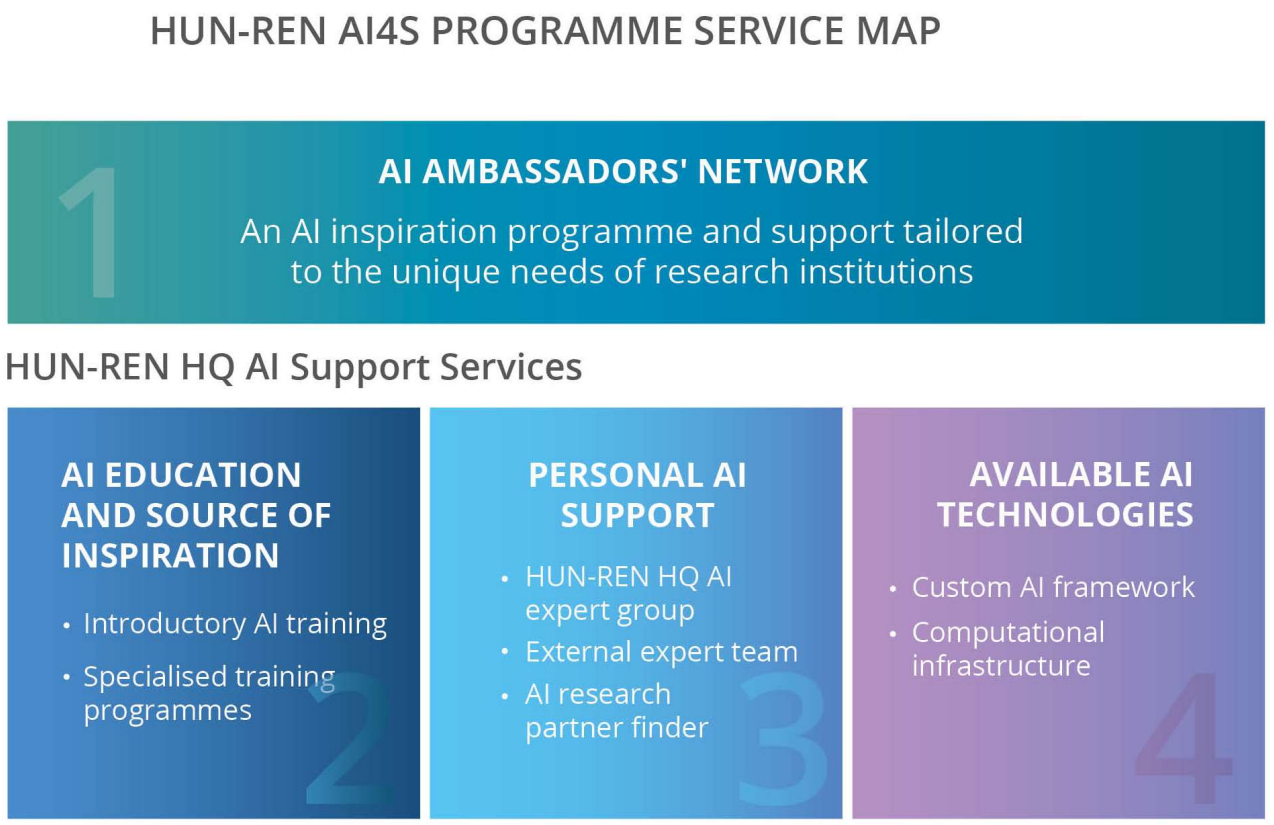


We launched HUN-REN AI 4 Science program

HUN-REN AI 4 SCIENCE PROGRAMME

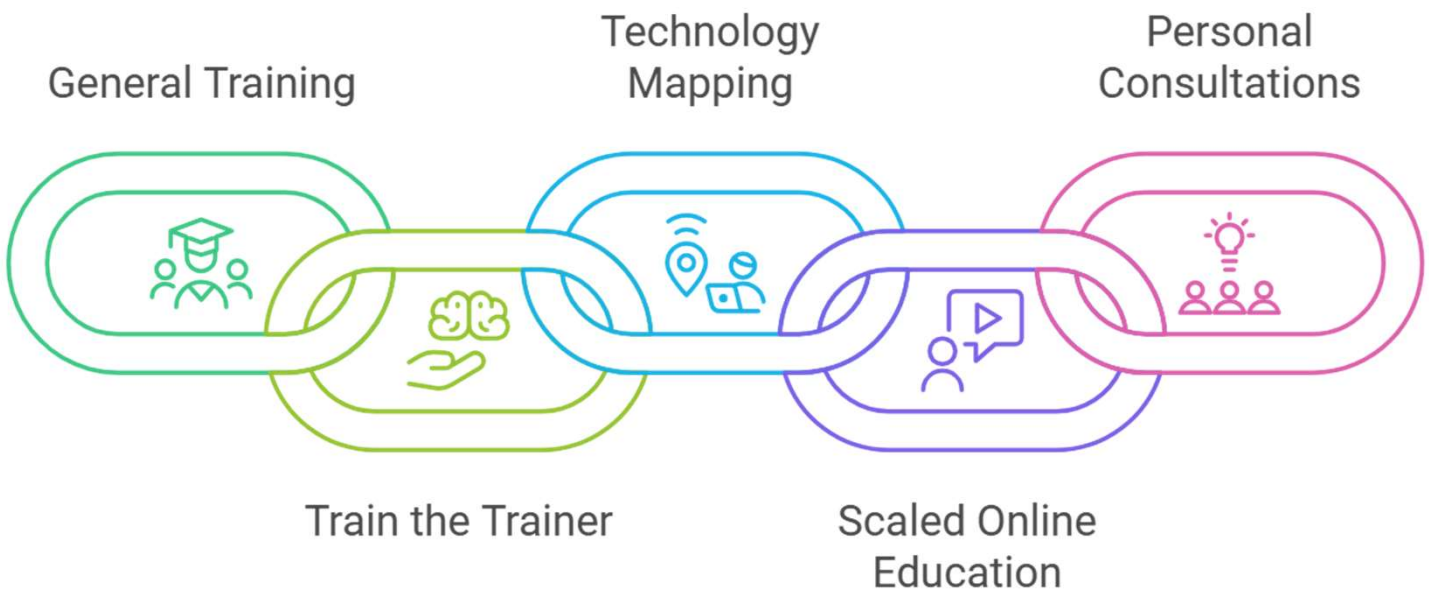
Enhancing the use of artificial intelligence in the Hungarian Research Network

Building on 4 main pillars



Scaling up training with centralized and distributed efforts

Delivered by the ambassadors

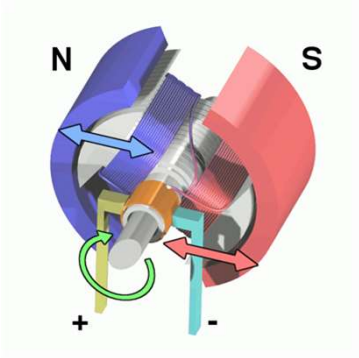


A LOT of tools…

Név	Link	Description
ResearchRabbit	https://www.researchrabbit.ai/	Automatikusan javasol kapcsolódó tanulmányokat, gyorsítva a kutatási anyagok gyűjtését és áttekintését.
Typset.io	https://typeset.io/	Tudományos cikkek elemzésére és az összefoglalók készítésére szolgál, hatékonyabbá téve az irodalomkutatást.
NotebookLM	https://notebooklm.google/	Interaktív jegyzetfüzet AI támogatással, amely segíti a komplex számítások és adatvizualizációk végrehajtását.
napkin.ai	https://www.napkin.ai/	Vizuális ötletgenerátor és gondolattérkép készítő eszköz, amely segít a koncepciók átlátható bemutatásában és megértésében.
Scite	https://scite.ai/	An AI tool that helps researchers find and understand scientific literature by automatically extracting key information from papers.
Consensus	https://consensus.app/	Tudományos kérdésekre ad összegző válaszokat, segítve a kutatókat a releváns szakirodalom gyors áttekintésében.
Elicit	https://elicit.com/	Támogatja a kutatás kérdésmegválaszolását és adatgyűjtést, lehetővé téve a hipotézisek strukturált tesztelését.
Claude	https://claude.ai/login?returnTo=%2F%3F#features	
Perplexity	https://www.perplexity.ai/	Gyors és pontos válaszokat kínál tudományos kérdésekre valós idejű adatforrások felhasználásával.
ChatGPT	https://chatgpt.com/	Szövegelemzésre, kódírásra és cikkösszegzésre használható, megkönnyítve az adatfeldolgozást és dokumentációt.
ChatPDF	https://www.chatpdf.com/	Lehetővé teszi PDF-ek gyors áttekintését és összegzését, amely segíthet komplex dokumentumok elemzésében.

The complexity of AI enabled tools

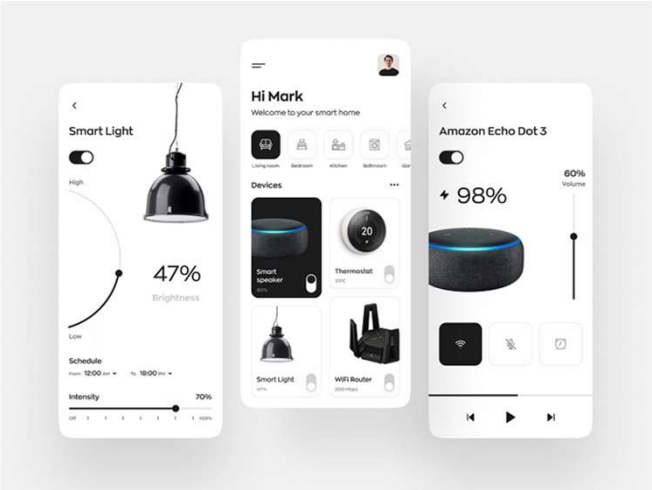
USER INTERFACE / APP



CENTRAL ENGINE

TASK TO COMPLETE

The complexity of AI enabled tools



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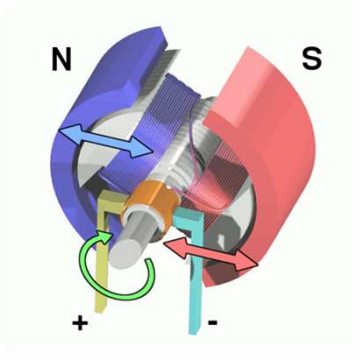

CENTRAL ENGINE

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APPLICATIONS

- chat.openai.com
- Copilot.Microsoft.com
- chat.mistral.ai/chat
- Perplexity.ai
- GenAI4Science

- NotebookLM.google
- Scispace.com
- Napkin.ai

- Github Copilot
- Cursor.ai

LLM MODELS

- GPT 4o
- Claude Sonnet 3.5
- Gemini 1.5 Flash

- Mistral Large
- Qwen 2.5 – 72B
- LLaMa 3.2 – 8B

TOOLS TO ACCESS

- Bing search
- Google search
- Elicit search
- Consensus search
- Code Interpeter
- Dalle 3

How can we imagine LLMs?

TRAINING

SKIMMING through tons of books, articles, research papers, github code…

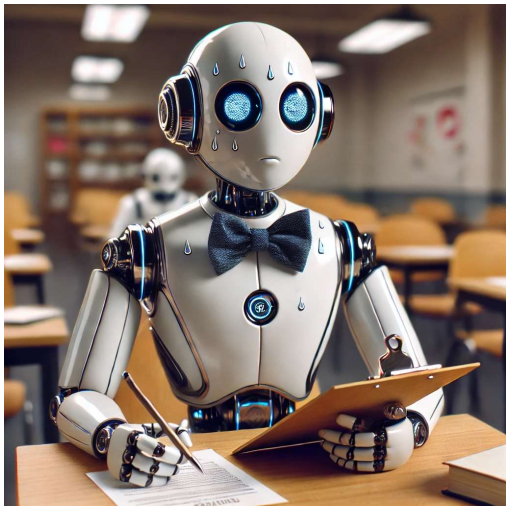
The Pile: approximately **500 000 000 pages of text**

GENERAL, WIDE, SHALLOW KNOWLEDGE

Whatever sticks from skimming through A LOT

CAPABILITY OF USING LANGUAGE

Understanding instructions and context and writing in **any** style required

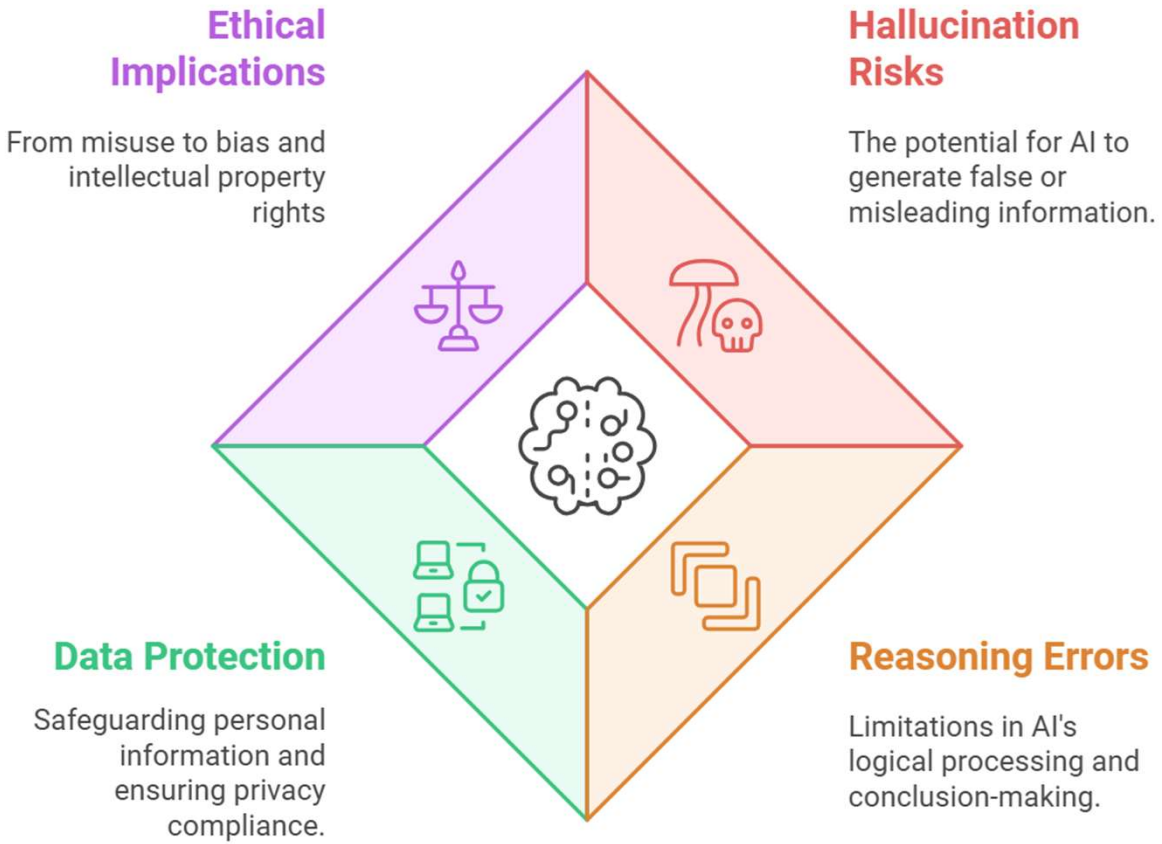


EXAM

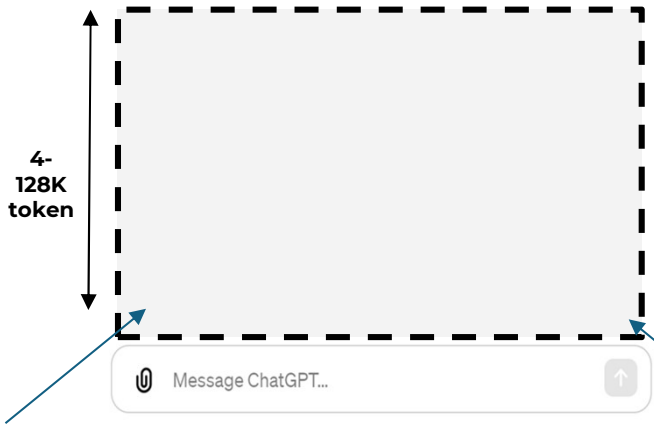
Whatever comes to mind!
Always follow instructions!
Read context given carefully!

Transforming text to text in a most probable way

What are the problems?



What context window is used for?



INSTRUCTION

How I want the model to behave?

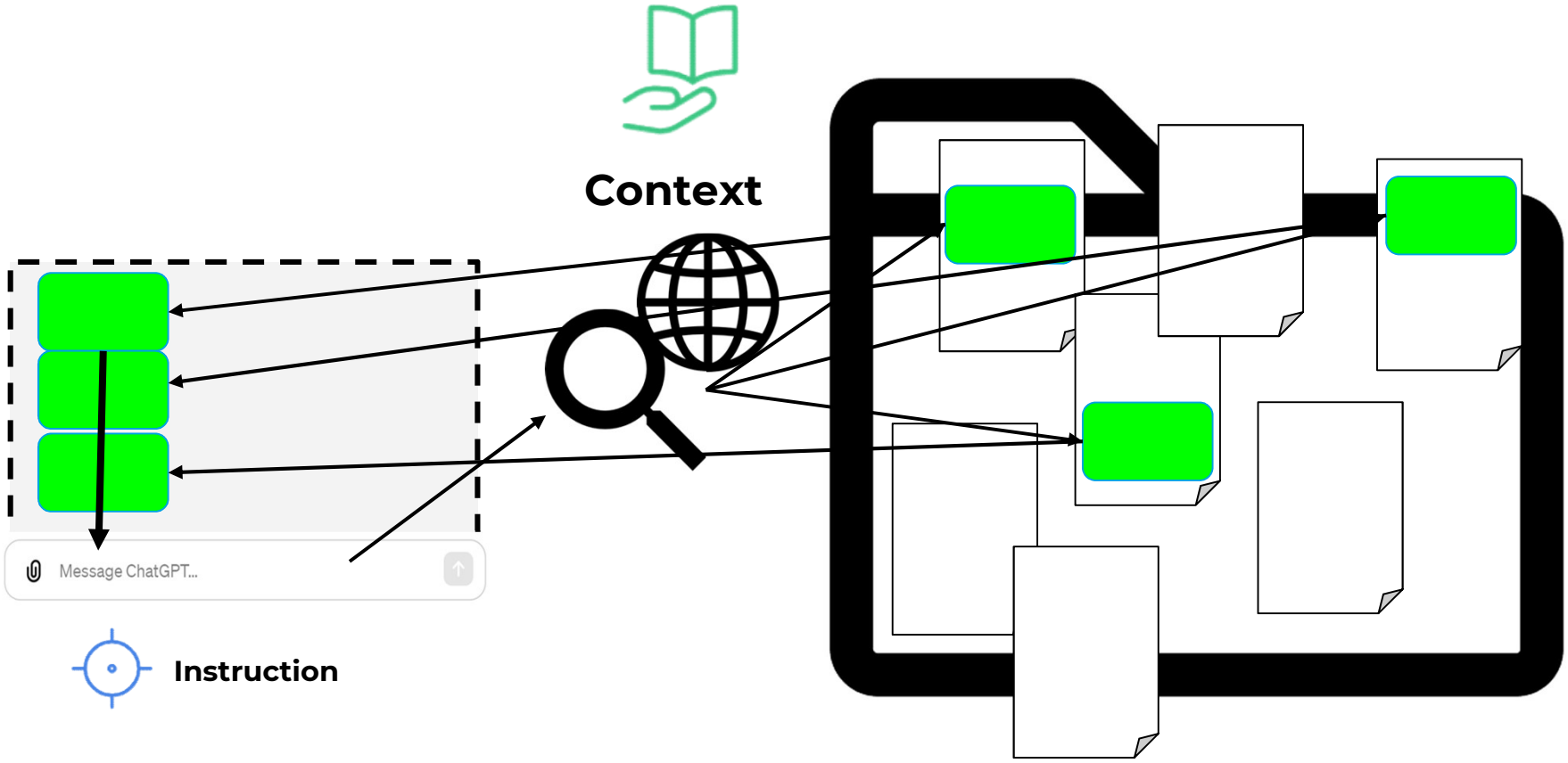
- Task
- Role
- Examples
- Style
- Goal
- Guardrails

CONTEXT

What I want it to keep in mind for the answer

- Text! (Not links)
- Can be long
- Can be unstructured
- It can

Extending beyond the context window



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https://hun-ren.hu/ai-4-science